medium-sized berg; N. 49° 19, W. 49° 09′, one large and two small bergs; N. 48° 00′, W. 46° 00′ to N. 47° 37′, W. 46° 30′, several large bergs and a large quantity of small detached pieces, very dangerous.

12th.—N. 47° 40′, W. 44° 05′ a large berg; N. 47° 26′, W. 45° 00′, three large bergs three miles apart east and west; N. 47° 14′, W. 46° 00′, a very large berg with flat top and perpendicular sides.

13th.—N. 48° 03°, W. 49° 48′, a small berg; N. 48° 16′, W. 49° 19′, three small bergs.

13–14th.—N. 46° 55′, W. 47° 10′ to N. 48° 08′, W. 44° 01′, six bergs and many pieces of ice.

14th.—N. 46° 54′, W. 45° 00′, large bergs about eighty feet high.

15th.—N. 48° 10′, W. 49° 03′, a very large berg; N. 48° 00′, W. 49° 48′, a very large berg and several small pieces to leeward.

16th.—N. 47° 35′, W. 42° 35′, a berg fifty feet high and three hundred feet long.

17th.—N. 46° 25′, W. 42° 53′, a berg seventy feet high and three hundred and fifty feet long; N. 46° 54′, W. 42° 00′, a berg about forty feet high and one hundred and fifty feet long one mile distant; N. 48° 10′, W. 49° 10′, several large bergs.

18th.—N. 48° 30′, W. 50° 40′, ten or twelve bergs; N. 48° 32′, W. 48° 43′, 10 a. m., passed several small bergs, and continued passing them until 4 p. m., when they set in thick, some being over one hundred feet high and four hundred feet long.

19th.—N. 47° 27′, W. 48° 20′, five large bergs from 9 a. m. till noon; N. 48° 10′, W. 47° 05′, two large bergs.

21st.—N. 46° 53′, W. 46° 05′ to N. 46° 40′, W. 47° 10′, twelve bergs, some large ones.

22d.—N. 46° 23′, W. 42° 19′, one long low-lying berg, with detached pieces, and a large piece of ice one mile to southward; N. 48° 18′, W. 49° 08′, one large and two small bergs; N. 48° 06′, W. 48° 59′, one large berg and several small pieces.

24th.—N. 45° 14′, W. 40° 43′, a small berg; N. 47° 53′, W. 48° 00′, one medium-sized berg.

26th.—N. 46° 45′, W. 43° 05′, a berg about one hundred and fifty feet high.

30th.—N. 45° 40′, W. 45° 16′, a medium-sized berg with one high peak.

30–31st.—N. 48° 51′, W. 47° 07′ to N. 48° 03′, W. 50° 21′, numerous large bergs.

31st.—N. 44° 35′, W. 48° 30′, three bergs within two to three miles; N. 47° 43′, W. 44° 16′, three bergs; N. 45° 34′, W. 47° 30′ to N. 45° 22′, W. 48° 00′, six small bergs; N. 48° 50′, W. 47° 26′ to N. 48° 15′ W. 49° 01′, several bergs, large and small.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for May, 1889, is exhibited on chart ii by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above.

For May, 1889, the mean temperature was highest in the middle and lower Colorado and the lower Gila valleys, where, at stations, the values rose above 80°, the highest mean reading, 84°.2, being reported at Mammoth Tank, Cal. Over southern and west-central Florida, the lower Rio Grande valley, the extreme southwestern part of New Mexico, southern Arizona, adjoining parts of California, southern Nevada, and Arizona, and within a limited area in east-central California, the mean temperature was above 75°. The mean readings were above 70° south of a line traced from Wilmington, N. C., irregularly westward to southern New Mexico, over southwestern Arizona, the western half of California south of the thirty-eighth parallel, and within limited areas in northwestern Nevada, central Kansas, and adjoining parts of west-central Tennessee and Arkansas. The lowest mean temperature for the month was noted at stations in central Colorado, where it fell below 40°. The mean values were below 50° in the lower Saint Lawrence valley, over Lake Superior and northern Lake Huron, and in the Canadian Northwest Territories.

The mean temperature was above the normal in New England, at a majority of stations in the eastern portions of the middle Atlantic and south Atlantic states, and within an area extending from the north Pacific coast and Columbia valley southeastward to Arizona, New Mexico, and northern Texas; in all other districts the temperature was generally below the normal. The greatest departures above the normal were noted in New Brunswick and Nova Scotia, where they exceeded 6°. The departures below the normal were small and nowhere amounted to 5°.

The following are some of the most marked departures from the normal at the older established Signal Service stations:

Above normal.		Below normal.	
	°		°
Chatham, N. B.	8.0	Fort Buford, Dak	4.8
Boston, Mass.	4.3	Mobile, Ala	4.5
Spokane Falls, Wash.	3.0	Abilene, Tex	4.5
Fort Apache, Ariz.	2.8	San Francisco, Cal.	4.2
Kitty Hawk, N. C.	2.5	Louisville, Ky.	3.9

DEVIATIONS FROM NORMAL TEMPERATURES.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for May, 1889; (4) the departure of the current month from the normal; (5) and the extreme monthly means for May during the period of observation and the years of occurrence:

State and station.	County.	(1) Normal for the month of May.	(2) Length of record.	(3) Mean for May, 1889.	(4) Departure from normal.	(5) Extreme monthly mean temperature for May.			
						Highest.	Year.	Lowest.	Year.
Arkansas.		°	*Years*	°	°	°		°	
Lead Hill	Boone	68.0	7	67.9	−0.1	74.4	1886	62.9	1882
California.									
Sacramento	Sacramento	64.3	36	61.4	−2.9	70.2	1865	58.5	1860
Colorado.									
Fort Lyon	Bent	63.4	20	60.1	−3.3	68.8	1879	58.9	1873
Connecticut.									
Middletown	Middlesex	57.0	22	60.0	+3.0	61.3	1864	52.4	1861
Florida.									
Merritt's Island	Brevard	75.2	5	73.9	−1.3	79.2	1884	70.3	1886
Georgia.									
Forsyth	Monroe	72.8	15	73.5	+0.7	75.8	1880	69.2	1877
Illinois.									
Peoria	Peoria	64.7	33	62.6	−2.1	71.4	1881	55.2	1867
Riley	McHenry	57.3	33	55.6	−1.7	64.4	1881	49.8	1867
Indiana.									
Vevay	Switzerland	65.1	22	64.2	−0.9	71.2	1880	60.4	1867
Iowa.									
Cresco	Howard	56.6	17	56.0	−0.6	64.1	1881	49.9	1888
Monticello	Jones	59.5	35	59.9	+0.4	68.1	1881	51.8	1867
Logan	Harrison	62.2	15	62.7	+0.5	71.3	1880	56.1	1878
Kansas.									
Lawrence	Douglas	65.1	27	64.2	−0.9	70.6	1880	55.5	1867
Wellington	Sumner	65.0	10	66.4	+1.4	71.1	1880	58.2	1882
Louisiana.									
Grand Coteau	Saint Landry	74.9	6	73.2	−1.7	75.7	1884	73.2	1889
Maine.									
Gardiner	Kennebec	53.3	49	56.7	+3.4	57.0	1880	49.1	1856
Maryland.									
Cumberland	Allegany	59.8	26	62.9	+3.1	67.0	1880	51.1	1866

Deviations from normal temperatures—Continued.

State and station.	County.	(1) Normal for the month of May.	(2) Length of record.	(3) Mean for May, 1889.	(4) Departure from normal.	(5) Extreme monthly mean temperature for May.			
						Highest.	Year.	Lowest.	Year.
Massachusetts.		°	Years	°	°	°		°	
Amherst	Hampshire	57.0	53	60.8	+3.8	64.2	1880	52.7	1842
Newburyport	Essex	55.2	10	58.9	+3.7	61.0	1880	50.2	1882
Somerset	Bristol	58.1	16	62.0	+3.9	63.6	1880	51.7	1882
Michigan.									
Kalamazoo	Kalamazoo	57.7	12	56.5	−1.2	66.0	1881	41.3	1882
Thornville	Lapeer	57.8	12	57.7	−0.1	66.6	1880	46.9	1877
Minnesota.									
Minneapolis	Hennepin	57.4	24	56.0	−1.4	63.4	1887	47.9	1867
Montana.									
Fort Shaw	Lewis & Clarke	54.3	20	52.8	−1.5	59.8	1869	47.4	1883
New Hampshire.									
Hanover	Grafton	54.3	54	59.2	+4.9	62.0	1880	48.7	1850
New Jersey.									
Moorestown	Burlington	60.5	26	62.1	+1.6	68.0	1880	54.4	1882
South Orange	Essex	60.6	17	60.7	+0.1	66.4	1880	57.3	1885
New York.									
Cooperstown	Otsego	54.5	35	57.0	+2.5	60.7	1880, '87	46.7	1861
Palermo	Oswego	54.8	35	57.2	+2.4	60.9	1887	47.5	1867
North Carolina.									
Lenoir	Caldwell	62.4	16	63.9	+1.5	67.8	1887	48.0	1881
Ohio.									
N'th Lewisburgh	Champaign	61.4	57	63.0	+1.6	68.0	1887	53.0	1838
Wauseon	Fulton	58.8	19	58.4	−0.4	64.3	1880	52.2	1882
Oregon.									
Albany	Linn	52.8	12	58.6	+5.8	60.3	1885	52.4	1880
Eola	Polk	53.8	19	57.9	+4.1	59.1	1888	45.2	1880
Pennsylvania.									
Dyberry	Wayne	54.3	22	56.3	+2.0	64.1	1880	43.7	1865
Grampian Hills	Clearfield	56.4	24	59.6	+3.2	65.1	1887	48.8	1867
Wellsborough	Tioga	56.5	10	55.3	−1.2	68.4	1879	50.5	1882
South Carolina.									
Statesburgh	Sumter	70.1	8	71.9	+1.8	73.8	1881	65.9	1885
Tennessee.									
Austin	Wilson	69.4	20	66.6	−2.8	79.2	1887	64.5	1877
Milan	Gibson	67.1	6	66.3	−0.8	71.4	1887	64.0	1883
Texas.									
Fort Concho	Tom Green	74.8	14	74.6	−0.2	81.1	1886	68.7	1884
New Ulm	Austin	74.4	16	73.1	−1.3	77.4	1879	72.0	1885
Vermont.									
Strafford	Orange	56.1	16	60.8	−4.7	63.0	1887	50.5	1882
Virginia.									
Bird's Nest	Northampt'n	65.2	21	66.1	+0.9	73.7	1880	60.8	1869
Wisconsin.									
Madison	Dane	56.8	20	55.4	−1.4	64.2	1870	51.5	1883
Washington.									
Fort Townsend	Jefferson	53.8	17	57.0	+3.2	57.0	1889	50.2	1880

The above table shows that at one station, Fort Townsend, Wash., with a broken record of seventeen years, the mean temperature for the month was 0°.2 above the highest previous mean for the month, recorded in 1885, and that one station, Grand Coteau, La., with a record of six years, reports a mean temperature, 0°.7, below the lowest previous mean for May, noted in 1885. At Fort Townsend the mean for the current month was 17° above the lowest May mean, recorded in 1880, and at Grand Coteau the mean was 2°.5 below the highest mean for May, noted in 1884. At Gardiner, Me., with a record of forty-nine years, the mean was but 0°.3 below the maximum mean temperature for the month, recorded in 1880. Among stations showing marked differences (10° or more) between the current mean and the highest mean temperature recorded for May are: Kalamazoo, Mich., twelve years record, 10° below mean of 1881; Wellsborough, Pa., ten years broken record, 13° below mean of 1879. Among stations showing marked differences (10° or more) between the current mean and the lowest mean temperature noted for May are: Cumberland, Md., twenty-six years record, 12° above mean of 1866; Somerset, Mass., sixteen years record, 10° above mean of 1882; Kalamazoo, Mich., twelve years record, 15° above mean of 1882; Thornville, Mich., twelve years broken record, 11° above mean of 1877; Hanover, N. H., fifty-four years record, 10° above mean of 1850; Cooperstown and Palermo, N. Y., thirty-five years record each, 10° above mean of 1861 and 1867, respectively; Lenoir, N. C., sixteen years record, 16° above mean of 1881; North Lewisburgh, Ohio, fifty-seven years record, 10° above mean of 1838; Eola, Oregon, nineteen years record, 13° above mean of 1880; Dyberry, Pa., twenty-two years broken record, 12° above mean of 1865; Grampian Hills, Pa., twenty-four years record, 11° above mean of 1867; Strafford, Vt., sixteen years record, 10° above mean of 1882.

MAXIMUM AND MINIMUM TEMPERATURES.

Maximum temperatures above 100° were reported in the valleys of the Gila and Colorado rivers in Arizona and Nevada, and in the Sacramento and San Joaquin valleys in California, the highest reading, 108°, being noted at Fort Mojave, Ariz. The temperature rose above 90° east of the Mississippi and south of the Ohio valleys, except along the east Gulf and New England coasts, at stations in the interior of Texas, the middle Missouri valley, the middle and southeastern slopes of the Rocky Mountains, portions of the plateau regions southward from the valley of the Columbia River, and north-central and southern California. The lowest maximum temperatures were noted along the south Rhode Island, southeast Massachusetts, and east Maine coasts, where they fell to or below 70°, the lowest reading, 69°, being reported at Nantucket, Mass. At a number of stations east of the Mississippi River, at one station in Texas, and at one station in Washington Territory the maximum temperature equalled or exceeded the highest temperature recorded during the periods of observation. At New Haven, Conn., with a record of seventeen years, the maximum temperature for May, 1889, was 2° above the highest previous reading for the month, which occurred in 1880; at Albany, N. Y., sixteen years record, the same as maximum of 1880; Atlantic City, N. J., sixteen years record, the same as maximum of two or more previous years; Cape Henry, Va., sixteen years record, 4° above maximum of 1875; Charlotte, N. C., eleven years record, 1° above maximum of 1881; Kitty Hawk, N. C., fifteen years record, 1° above maximum of 1880; Wilmington, N. C., nineteen years record, 2° above maximum of 1878; Charleston, S. C., seventeen years record, 2° above maximum of 1878; Indianapolis, Ind., sixteen years record, 1° above maximum of two or more previous years; Buffalo, N. Y., seventeen years record, 2° above maximum of 1876; Rochester, N. Y., eighteen years record, 2° above maximum of 1879; Alpena, Mich., seventeen years record, the same as maximum of 1874; Springfield, Ill., ten years record, the same as maximum of 1881; Fort Elliott, Tex., ten years record, 2° above maximum of 1886; Olympia, Wash., twelve years record, the same as maximum of 1887. At stations in the upper Mississippi, Missouri, and Rio Grande valleys, the middle and west Gulf states, on the eastern slope of the Rocky Mountains, and along the north and south Pacific coasts the maximum temperature was below the maximum reported for the corresponding month of previous years by values exceeding 10°, and amounting to 19° at Fort Buford, Dak. The maximum temperature for May, in preceding years, was generally noted in New England and the middle Atlantic states in 1880; in the south Atlantic states in 1878; in Tennessee and the lower Lake region in 1879; in the upper Mississippi valley in 1874; in northern Texas, Arkansas, Indian Ter., and Montana in 1886; in the middle and north plateau regions, and the middle and north Pacific coasts in 1887; in all other districts the periods of occurrence were irregular.

The lowest temperatures for the month were reported in east-central Dakota and the adjoining part of Minnesota, where they fell to or below 20°. The values were below 30° over Lake Huron, eastern and northern Lake Superior, the upper Missouri valley, over portions of the northeastern and middle-eastern slope of the Rocky Mountains, and within an elongated area extending from south-central Oregon to northwestern Arizona. The highest minimum temperature, 66°, was reported at Key West, Fla., while at Hatteras, N. C., at stations on the Georgia, Florida, and west Gulf coasts, and at Yuma, Ariz., and San Diego, Cal., the minimum readings were above 50°. At a number of stations in the Southern States, and from Texas northward to Minnesota and Dakota the lowest temperature recorded during the periods of observation was noted. At Charlotte, N. C., eleven years record, the minimum temperature for May, 1889, was 2° below the lowest previous reading for the month, which occurred in 1888; Pensacola, Fla., ten years record, the same as minimum of 1883; Mobile, Ala., nineteen years record, 1° below minimum of

1883; Montgomery, Ala., seventeen years record, the same as minimum of 1883; New Orleans, La., nineteen years record, 2° below minimum of 1871 and 1877; Fort Smith, Ark., seven years record, 2° below minimum of 1885; Little Rock, Ark., ten years record, the same as minimum of 1883; San Antonio, Tex., twelve years record, 1° below minimum of 1887; Knoxville, Tenn., nineteen years record, the same as minimum of 1888; Moorhead, Minn., nine years record, the same as minimum of 1883; Huron, Dak., eight years record, 2° below minimum of 1888; North Platte, Nebr., fifteen years record, 3° below minimum of 1885; Fort Elliott, Tex., ten years record, the same as minimum of 1885; Fort Sill, Ind. T., twelve years record, 4° below minimum of 1887. The minimum temperture reported for May in preceding years was generally noted in western Pennsylvania, Virginia, and along the coasts of North Carolina and South Carolina in 1876; on the Georgia and east and south Florida coasts and Rio Grande valley in 1877; in the east Gulf states in 1883; in the upper Mississippi and Missouri valleys, and over Lake Michigan in 1875; on the northeastern slope of the Rocky Mountains in 1885; over the middle plateau region in 1887; on the south Pacific coast in 1883; in all other districts the minimum temperatures were noted for different years at the several stations. The minimum temperatures were less than 10° above the absolute minimum temperatures for May for preceding years, except in western Pennsylvania, at stations in the upper Mississippi and Missouri valleys, and in western Oregon, where the readings were 10° to 11° above the lowest previous values.

RANGES OF TEMPERATURE.

The greatest and least daily ranges of temperature at regular stations of the Signal Service are given in the table of miscellaneous meteorological data. The greatest monthly ranges occurred in the middle Missouri and upper Red River of the North valleys, along parts of the Lake Ontario and Lake Huron coasts, in adjoining portions of northern Texas and Indian Territory, and within an area extending from New Mexico and Arizona to southern Oregon, where they exceeded 60°, and at one station, Ashland, Oregon, 70°. The ranges generally decreased from the interior of the country to the Atlantic, Pacific, and Gulf coasts, where, at a number of stations, they were less than 30°.

The following are some of the extreme monthly ranges:

Greatest.	°	Least.	°
Ashland, Oregon	72.0	Key West, Fla	20.0
Huron, Dak	68.0	Eureka, Cal	25.0
Fort Supply, Ind. T	66.0	Port Eads, La	25.0
Alpena, Mich	65.0	Brownsville, Tex	28.0
Lava, N. Mex	64.0	Nantucket, Mass	29.0
Rochester, N. Y	61.0	Jupiter, Fla	33.0

TEMPERATURE OF WATER.

The following table shows the maximum, minimum, and mean water temperature as observed at the harbors of the several stations; the monthly range of water temperature; and the mean temperature of the air for May, 1889:

Stations.	Temperature at bottom.				Mean temperature of air at the station.
	Max.	Min.	Range.	Monthly mean.	
	°	°	°	°	°
Boston, Mass	62.0	47.8	14.2	54.9	60.3
Canby, Fort, Wash	64.0	55.5	8.5	58.8	55.1
Cedar Keys, Fla	86.8	68.9	17.9	80.3	73.0
Charleston, S. C	77.8	67.7	10.1	73.7	73.6
Eastport, Me	43.8	40.0	3.8	41.7	49.4
Galveston, Tex	81.0	72.0	9.0	76.0	73.7
Key West, Fla	86.4	75.0	11.4	81.9	77.8
Nantucket, Mass	66.0	52.0	14.0	59.6	54.2
New York City	62.5	49.6	12.9	57.2	62.0
Pensacola, Fla	77.3	70.3	7.0	73.7	71.4
Portland, Oregon	67.5	55.0	12.5	59.4	60.3

FROST.

Frost was reported in all of the Southern States, except Florida and Louisiana, but was not noted as far south as during the preceding month. It was not reported along or near the middle and south Atlantic and Gulf coasts, nor on the Pacific coast, except at stations in north-central and south-central Oregon. Frost injured crops and tender vegetation in some of the more Northern States and territories east of the Pacific coast, and in Arkansas, North Carolina, and Tennessee it damaged cotton plants. The following reports of frost, injurious to vegetation, have been made:

Fayette, Fayette Co., Iowa: frost on the 1st, 2d, 3d, 21st, and 22d caused damage to corn, potatoes, and garden vegetables; fruit also suffered slightly.—*Report of voluntary observer.*

Fort Sully, Dak., 2d: the minimum temperature this morning was 25°. The prevailing cold weather has done much damage to early garden crops.

Chicago, Ill., 3d: dispatches from Decatur, Galesburgh, Monticello, and Tuscola, Ill., and from Wabash, Crawfordsville, and Covington, Ind., report heavy frost the last two nights. In many places small fruit was reported killed, and many vegetables and potatoes were frozen. In some places snow fell, and at Crawfordsville ice formed a quarter of an inch thick.—*New York Daily Tribune, May* 4.

Dale Enterprise, Rockingham Co., Va.: a damaging frost occurred the night of the 3d–4th, killing tender vegetation, and the corn, which has just appeared above ground, is injured.—*Report of voluntary observer.*

Little Rock, Ark.: the frost which occurred on the bottom lands the morning of the 4th was very destructive to young corn and cotton.

Bluefield, Mercer Co., W. Va., 4th: after five days of almost incessant rain and gradually lowering temperature this section was visited last night by a heavy frost. Ice formed on the ponds in many places. Farmers from this and McDowell counties, and of Tazewell, Russell, and Bland counties, Virginia, are unanimous in their fear that the fruit is totally destroyed.—*Baltimore American, May* 5.

Lincoln, Kewaunee Co., Wis.: a severe frost occurred on the 4th and 5th; ice one-eighth inch thick formed, killing early potatoes and corn.—*Report of voluntary observer.*

Lexington, Rockbridge Co., Va., 4th: a very heavy frost occurred; ice formed in places and the ground froze. The damage to truck gardens and early vegetation is heavy, most of the crops being killed.—*The (Lynchburgh, Va.) Advance, May* 4.

Lynchburgh, Va., 4th: a heavy frost in the morning covered this section, doing, it is feared, serious damage to fruit and vegetables. In the mountain ranges for nearly two hundred miles it was very heavy.—*Baltimore American, May* 5.

Reading, Pa., 4th: for the last three nights considerable damage has been done in this section to early vegetation by hard frost.—*Duluth (Minn.) Daily News, May* 5.

Kalamazoo, Kalamazoo Co., Mich.: a disastrous frost visited southwestern Michigan during the 20th–21st. Reports from all sections show great damage to early vegetables and small fruit, and in some localities wheat and corn suffered severely.—*Rochester, N. Y., Union and Advertiser, May* 29.

Milwaukee, Wis.: reports from Hudson, La Crosse, Chippewa Falls, Necedah, Columbus, and Rosedale, Wis., show that frost on the morning of the 22d was destructive in those sections. Corn and potatoes were frozen in the ground, and tender garden vegetables were severely damaged. The condition of corn in some places will necessitate replanting. Grapes and small fruit also sustained injury.—*The (Milwaukee) Evening Wisconsin, May* 22.

Port Huron, Mich.: reports show that frost on the 23d was very destructive in this section, especially to all kinds of fruit. Clover, corn, and oats were also badly injured, and in some places the foliage on trees was entirely killed. A somewhat strange fact in connection with the frost is that a few miles inland, upon soil of a dark color, the effect was much more serious than upon soil of a light color, the line of demarcation being plainly seen. This statement was made by J. W. Thompson, sr., who owns a farm some miles from this place.

Charlotte, N. C., 23d: frost is reported from the surrounding country. Some cotton is reported killed by it.

Columbus, Bartholomew Co., Ind., 24th: a heavy frost occurred here last night, which did considerable damage to fruit and vegetables. The wheat, which is heading out, is somewhat injured.—*Oswego, N. Y., Daily Times, May* 24.

Wabash, Ind.: great damage was done to the corn and potato crops in this vicinity by the freeze during the night of the 22–23d. The corn plants are brown and withered, and the crop will be cut short, if replanting to a large extent may not be required. The weather is the coldest ever known at this season.—*Rochester, N. Y., Democrat and Chronicle, May* 25.

Marquette, Mich., 25th: heavy frost occurred during the night, causing some damage to vegetation.

Dover, Strafford Co., N. H., 27th: there was a heavy frost in this vicinity yesterday morning, doing great damage to crops.—*Rochester, N. Y., Union and Advertiser, May* 27.

Detroit, Mich.: reports from Holland, Pontiac, Cadillac, Battle Creek, and Galesburgh, Mich., state that a very damaging frost occurred on the morning of the 28th. Corn, fruit, and garden vegetables were killed, and potatoes, clover, wheat, and rye seriously injured. Much of the corn will have to be replanted. Ice formed in places one-half inch thick.—*Detroit Tribune, May* 29.

Milwaukee, Wis., 28th.: reports from Plymouth, Oshkosh, Ellsworth, Delavan, Fort Atkinson, and Palmyra, Wis., show that the frost which occurred during the morning was very destructive to small fruit, corn, garden vegetables, etc. The frost-bitten section is quite wide-spread.—*The (Milwaukee) Evening Wisconsin, May* 28.

Alpena, Mich: frost on the mornings of the 28th and 29th did considerable damage to vegetation, trees, and garden truck.

Jamestown, Chautauqua Co., N. Y., 29th: frost did immense damage in western New York and northern Pennsylvania last night. Reports show that the damage to grass, wheat, potatoes, flowers, and vegetables is inestimable. Farmers have already commenced replanting such crops as will have time to mature.—*Cleveland Reader and Herald, May* 30.

Rochester, N. Y., 29th: reports from Medina, Chili Station, Warsaw, North Cohocton, Mount Morris, Buffalo, and Albany, N. Y., state that the frost of last night caused much damage to early crops at those places. Fruit also suffered severely.—*Rochester, N. Y., Post Express, May* 29.

Erie, Pa.: the frost on the morning of the 29th injured vegetation seriously.

Memphis, Tenn.: the frost which occurred on the morning of the 31st was general throughout this section, and will prove disastrous to young cotton in the lowlands.

Saint Paul, Minn.: reports show that the frost during the last four days of the month was general and very destructive throughout the state. All tender plants were ruined; corn was badly hurt, and, in some places, even oats and wheat showed the effects of it.

Milwaukee, Wis., 31st: frosts and cold weather during the month have caused slight damage in this vicinity to strawberries, vegetables, etc. In the interior and northern portions of the state the damage was considerable, and will necessitate the replanting of corn, tobacco, and other crops in many places.

LIMITS OF FREEZING WEATHER.

The southern and western limits of freezing weather for May, 1889, are shown on chart ii. A line representing the southern limit is traced from north-central New England south of west over the lower lakes to southern Michigan, and thence northwestward to Duluth, Minn., where it recurves southwestward to southwestern New Mexico. A line showing the western limit of freezing weather is traced from east-central Arizona northwestward to southwest Oregon where it curves to the east and southeast over northwestern Utah, and is thence continued northward over western Montana into the British Possessions.

As compared with the preceding month the southern limit of freezing weather east of the Missouri Valley averages about 5° further north; in New Mexico and Arizona it is about the same; while over the plateau regions, north of the fortieth parallel, the western limit is about 5° further east.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for May, 1889, as determined from the reports of over 2,000 stations, is exhibited on chart iii. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for each Signal Service station. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

In May, 1889, the precipitation was greatest from central Pennsylvania southward to central Virginia, where it generally exceeded ten inches, the greatest depth of rainfall in that section, 12.41 inches, being reported at McConnellsburgh, Pa.; in west-central Illinois, 10.63 inches were recorded for White Hall; in central Missouri, along the Missouri River, 14.35 inches fell at New Frankford; in east-central Kansas 12.14 inches fell at Lebo, and at one station, Crescent City, in the extreme northwest part of California, 10.91 inches were reported. The smallest precipitation east of the Rocky Mountains was reported at Cedar Keys, Fla., where the total rainfall for the month was less than 0.01 of an inch, and at stations in the Rio Grande Valley and northeastern Dakota, where less than one-half inch fell. In the Rocky Mountain and plateau regions the rainfall exceeded three inches at stations in central Colorado and northern Montana, and in adjoining parts of western Oregon and Washington Territory the total precipitation for the month exceeded four inches. At a majority of stations in Arizona, south of the thirty-fifth parallel, and in adjoining parts of California and New Mexico no rainfall was reported. Along the Pacific coast the precipitation for the month varied from ten inches, or more, on the extreme northern coast of California, to less than two inches in northern Washington Ter., and to 0.03 of an inch at San Diego, Cal.

The precipitation for May, 1889, generally averaged above the normal in districts lying north of the thirty-fifth parallel, except from the Missouri valley southward to northern Texas, in Maine, the Canadian Maritime Provinces, the Saint Lawrence valley, the eastern lower lake and the northern upper lake regions, northern Wisconsin, and Minnesota, where it was deficient. Over a greater portion of the country lying south of the thirty-fifth parallel the precipitation was below the normal. The greatest departures above the normal occurred in the middle Atlantic states, the most marked excess, 7.21 inches, being noted at Washington, D. C. In the Missouri Valley, embracing portions of Missouri and Kansas, the total for the month exceeded the normal by more than four inches; in the southeastern part of Washington Territory by more than three inches; on the southeast coast of New England, and in the Sacramento Valley, California, by more than two inches. The greatest departures below the normal occurred over the northern extremity of Texas, and in the extreme southern part of the Mississippi Valley, where they amounted to more than four inches. At stations in the Missouri Valley, along the west Gulf and a part of the south Atlantic and Florida coasts the rainfall for the month was three inches, or more, below the normal, while in adjoin-